

## Pest Profile

Updated 03/26/2007

**Common Name:** Light Brown Apple Moth (LBAM)

**Scientific Name:** *Epiphyas postvittana* (Walker)

**Order and Family:** Lepidoptera, Tortricidae

**Distribution in California Counties:** Alameda, Contra Costa

**Background:** This moth is originally from Australia, and has become established in New Zealand, New Caledonia, Hawaii and the British Isles. Its discovery in California is a new North American record. Currently, it has been found in an approximate 30 square mile area from Richmond to Alameda.

**Description:** Adults are light brown, yellowish moths with varying amounts of darker brown, with a wingspan of 16-25 mm (Fig. 1). Eggs are pale white and deposited slightly overlapping each other in groups of 20-50. Larvae are green, about 18 mm long at maturity. Pupae are brown, about 11 mm long.



Figure 1. Light brown apple moth adults.

**Hosts:** LBAM has been found and recorded in over 200 plants in 120 plant genera in 50 families (Appendix A). Some notable trees and ornamental shrubs are apple, pear, peach, apricot, citrus, persimmon, avocado, oak, willow, walnut, poplar, cottonwood, alder, pine and eucalyptus. Other shrub or herbaceous hosts are grape, kiwifruit, strawberry, woody berries (blackberry, blueberry, boysenberry, raspberry), rose, camellia, jasmine, chrysanthemum, clover and plantain.

**Life Cycle and Damage:** Development is continuous, with no true dormancy. In Australia, this moth typically has three generations per year and over-winters as a larva. Adults deposit egg masses containing 20-50 eggs on the upper leaf surface or on fruit. Larvae disperse and construct silken shelters on the underside of leaves, usually near a midrib or large vein. Older larvae roll together leaves and buds or fruit with webbing. Damage to fruit occurs as surface feeding by the larvae. Larvae will occasionally enter the fruit to feed. Pupation takes place within the larval nests.

**Survey Methods:** There is a pheromone lure for the males, namely 95:5 mixture of (E)-11-Tetradecenyl acetate: (E,E)-9, 11-Tetradecadienyl acetate.

**Management:** Mating disruption, parasitoids and various insecticides have been used to control LBAM elsewhere.

**Economic Impact:** The impact on production costs for LBAM hosts could top \$100 million. It was estimated for Australia that LBAM causes AU\$21.1 million annually in lost production and control costs, or about 1.3% of gross fruit value, for apples, pears, oranges and grapes (Sutherst 2000). Applying this percentage to the 2005 gross value of these same crops in California of \$5.4 billion (USDA NASS 2006), the estimated annual production costs would be \$70.2 million. This estimate does not include economic costs to the nursery industry nor to other significant host crops in California such as apricots, avocados, kiwifruit, peaches and strawberries. If the same level of costs were incurred by these as for the previous four crops, the additional costs would be \$63.1 million, based on their 2005 gross value of \$4.8 billion. Therefore, the total lost production and control costs in California could be \$133 million for all of the crops mentioned above.

Exact economic impacts on international and domestic exports are uncertain at this time. California is the nation's leader in agricultural exports and in 2003 shipped more than \$7.2 billion in both food and agricultural commodities around the world (CASS 2004). Some countries have specific regulations against this pest, and many others consider it a regulated pest that would not be knowingly allowed to enter. Additional measures, such as preharvest treatments and postharvest disinfestation, would likely have to be taken to ensure that shipments to these countries are free from LBAM. In addition, LBAM is an exotic pest, i.e., it is not established in the continental United States, and therefore other states within the U.S. would likely impose restrictions on the movement of potentially infested fruits, vegetables and nursery stock. These restrictions could severely impact the domestic marketing of California agricultural products.

**Environmental Impact:** Establishment of this moth could cause direct environmental damage via increased pesticide use statewide by commercial and residential growers and via adverse feeding impacts on native plants. Populations of threatened and endangered plant species could be severely threatened or extirpated should this moth adapt to feeding on them.

**Methods of Artificial Spread:** The most significant route of artificial spread is likely to be on plants sold through nurseries and destined for commercial, ornamental and garden plantings. Other methods of spread are on green waste, fruit and conveyances.

### **Literature Cited**

CASS. 2004. California Agricultural Statistics 2003. California Agricultural Statistics Service, Sacramento, California. 92 pp.

Sutherst, R. W. 2000. Pests and Pest Management – Impact of Climate Change. Rural Industries Research and Development Corporation. Publication No. 00/16, Project No. CSE-76A. 34 pp.

USDA NASS. 2006. California County Agricultural Commissioners' Data, 2005. United States Department of Agriculture, National Agricultural Statistics Service, California Field Office, Sacramento, California. 80 pp.

## Appendix A

### Host List

*Abies grandis* (grand fir)  
*Acacia* spp. (acacias)  
*Achillea millefolium* (common yarrow)  
*Actinidia chinensis* (Chinese gooseberry)  
*Actinidia deliciosa* (kiwifruit)  
*Adiantum* spp. (maidenhair ferns)  
*Alnus glutinosa* (black alder/European alder)  
*Amaranthus* spp. (amaranths)  
*Apium graveolens* (celery)  
*Aquilegia* spp. (columbines)  
*Arbutus* spp. (madrone, strawberry tree)  
*Arctotheca* spp. (capeweeds, cape dandelion)  
*Arctotis stoechadifolia* (African daisy)  
*Artemesia* spp. (mugwort, sage brush, tarragon, worm wood, etc.)  
*Astartea* spp.  
*Aster* spp. (asters)  
*Baccharis* spp. (coyote brush, desert broom)  
*Boronia* spp. (boronias)  
*Brassica* spp. (broccoli, cabbage, cress, mustard, radish, turnip, etc.)  
*Breynia* spp. (snow bush)  
*Buddleia* spp. (butterfly bush)  
*Bursaria* spp. (black thorns)  
*Calendula* spp. (calendula)  
*Callistemon* spp. (bottle brush)  
*Camellia japonica* (camellia)  
*Campsis* spp. (trumpet creeper, trumpet vine)  
*Capsicum frutescens* (chile pepper)  
*Cardus nutans* (musk thistle)  
*Cassia* spp. (golden shower, pink shower, rainbow shower, gold medallion tree)  
*Ceanothus* spp. (buck brush, wild lilac)  
*Cedrus* spp. (cedar)  
*Centranthus* spp. (fox's brush/heliotrope/valerian)  
*Chamaecyparis lawsoniana* (Lawson's cypress)  
*Chenopodium album* (fat-hen)  
*Chimonanthus* sp. (wintersweet)  
*Choisya* spp. (Mexican orange)  
*Chrysanthemum* spp. (chrysanthemums)  
*Chrysanthemum x morifolium* (mums)  
*Cirsium arvense* (Canada thistle)  
*Cirsium vulgare* (bull thistle)  
*Citrus* spp. (citrus)  
*Clematis* spp. (clematis, virgin's bower, lather flower, vase vine)  
*Clerodendron* spp. (bleeding heart vine, bowers, tubeflower, Turk's turban)  
*Conyza bilbaoana* (a fleabane)  
*Cordyline australis* (cabbage tree)  
*Correa* spp. ((Australian fuchsia)  
*Cotoneaster* spp. (cotoneaster)  
*Crataegus* spp. (hawthorn)  
*Crocosmia* spp. (montbretia)

*Cryptomeria japonica* (Sugi)  
*Cucumis sativus* (cucumber)  
*Cucurbita* spp. (pumpkin)  
*Cupressus* sp. ((cypress)  
*Cydonia* spp. (quince)  
*Cyphomandra betacea* (tree tomato)  
*Cytisus scoparius* (Scotch broom)  
*Dahlia* spp. (dahlia)  
*Datura* spp. (angel's trumpet, Jimson weed, thorn apple)  
*Daucus* spp. (carrot, Queen Anne's lace)  
*Dodonaea* spp. ((hop bush, hopseed bush)  
*Diospyros* spp. (persimmon)  
*Erica lustanica* (Spanish heath)  
*Eriobotrya* spp. (loquat)  
*Eriostemon* spp. (wax flower)  
*Escallonia* spp. (escallonias)  
*Eucalyptus* spp. (eucalyptus, gum trees)  
*Euonymus* spp. (euonymus)  
*Feijoa sellowiana* (feijoa, pineapple guava)  
*Forsythia* spp. (forsythias)  
*Fortunella* spp. (kumquats)  
*Fragaria* spp. (strawberry)  
*Fraxinus velutina* (velvet ash)  
*Gelsemium* spp. (Carolina jessamine)  
*Genista* spp. (brooms)  
*Gerbera* spp. (Transvaal daisy)  
*Gypsophila paniculata* (baby's breath)  
*Grevillea* spp. (hummingbird bush, grevilleas)  
*Hardenbergia* spp. (lilac vine)  
*Hebe* spp. (hebe)  
*Hedera* spp. (ivy)  
*Helianthus tuberosus* (Jerusalem artichoke)  
*Helichrysum* spp. (curry plant, licorice plant, straw flower)  
*Humulus lupulus* (hops)  
*Hypericum androsaemum* (sweet-amber)  
*Hypericum calycinum* (Aaron's beard)  
*Hypericum humifusum* (trailing St. John's wort)  
*Hypericum perforatum* (St John's wort)  
*Ilex* sp. (holly)  
*Jasminum* spp. (jasmine)  
*Juglans* spp. (California black walnut, butternut)  
*Kunzea ericoides* (white tea tree)  
*Lagunaria patersonii* (Norfolk Island hibiscus)  
*Lathyrus* spp. (sweet pea)  
*Lavendula* spp. (lavenders)  
*Leptospermum* spp. (tea trees)  
*Leucodendron* spp. (silver tree)  
*Ligustrum* spp. (privet)  
*Linum* spp. (flax)  
*Litchi chinensis* (litchi)  
*Lonicera* spp. (honeysuckles)  
*Lupinus* spp. (lupines)

*Lycopersicum* spp. (tomatoes)  
*Macadamia* spp. (macadamia)  
*Malus* spp. (apple)  
*Mangifera* spp. (mango)  
*Medicago sativa* (alfalfa)  
*Melaleuca* spp. (honey myrtle, bottlebrush)  
*Mentha* spp. (mint)  
*Mesembryanthemum* spp. (ice plant)  
*Metrosideros excelsa* (New Zealand Christmas tree)  
*Michelia* spp. (michelia)  
*Monotoca* spp. (broomheaths)  
*Myoporum* spp. (myoporum)  
*Olea europaea* (olive)  
*Oxalis* spp. (lady's sorrel, redwood sorrel, wood sorrel)  
*Parkinsonia aculeata* (Mexican Palo Verde)  
*Parthenocissus* spp. (woodbine, Virginia creeper)  
*Passiflora edulis* (passionfruit)  
*Passiflora mollissima* (banana passionflower or passionfruit or poka)  
*Pelargonium* spp. (florist's geraniums)  
*Persea americana* (avocado)  
*Persoonia* spp.  
*Petroselinum* spp. (parsley)  
*Phaseolus vulgaris* (common bean)  
*Philadelphus* spp. (mock orange)  
*Phormium tenax* (New Zealand flax)  
*Photinia* spp. (photinia)  
*Picea* spp. (spruce)  
*Pieris japonica* (Japanese pieris or andromeda)  
*Pinus* spp. (pines)  
*Pisum sativum* (pea)  
*Pittosporum* spp. (pittosporums)  
*Plantago lanceolata* (narrowleaf plantain)  
*Plantago major* (common plantain)  
*Platysace* spp. (native parsnip)  
*Polygala* spp. (milkworts)  
*Polygonum* spp. (fleece flower, knotweed, smartweed)  
*Populus* spp. (cottonwood, poplar)  
*Prunus amygdalus* (almond)  
*Prunus armeniaca* (apricot)  
*Prunus avium* (sweet cherry)  
*Prunus domestica* (plum)  
*Prunus persica* (peach)  
*Prunus persica* var *nectarina* (nectarine)  
*Pseudopanax* sp. (lancewood)  
*Pseudotsuga japonica* (Japanese Douglas-fir)  
*Pseudotsuga menziesii* (Douglas-fir)  
*Pteris* spp. (brake, dish fern, table fern)  
*Pulcaria* spp.  
*Pyllanthus* spp.  
*Pyracantha* spp. (fire thorn)  
*Pyrus* spp. (pear)  
*Quercus* spp. (oak)

*Ranunculus* spp. (buttercups, crowfoot)  
*Raphanus* spp. (wild radish)  
*Reseda* spp. (mignonette)  
*Rhododendron* spp. (rhododendron)  
*Ribes* spp. (currant)  
*Robinia pseudoacacia* (black locust)  
*Rosa* spp. (roses)  
*Rubus* spp. (blackberry, boysenberry, raspberry)  
*Rumex acetosa* (garden sorrel, spinach dock)  
*Rumex acetosella* (common sheep sorrel)  
*Rumex pulcher* (fiddle dock)  
*Rumex crispus* (curled dock)  
*Rumex obtusifolius* (broadleaf dock)  
*Salix* spp. (willow)  
*Salvia* spp. (sages)  
*Senecio* spp. (dusty-miller, groundsels)  
*Sequoia* sp. (redwood)  
*Sida* spp. (Virginia mallow)  
*Sisymbrium* spp.  
*Smilax* spp. (greenbrier, Jacob's ladder, wild sarsaparilla)  
*Solanum tuberosum* (potato)  
*Solidago canadensis* (Canada goldenrod)  
*Sollya* spp. (Australian bluebells, bluebell creeper)  
*Sonchus asper* (spiny sowthistle)  
*Sonchus kirkii* (shore sowthistle)  
*Sonchus oleraceus* (common sowthistle)  
*Thuja plicata* (Western red cedar)  
*Tithonia* spp. (Mexican sunflower)  
*Trema* spp.  
*Trifolium* spp. (clover)  
*Triglochin* spp. (arrow grass)  
*Ulex europaeus* (gorse)  
*Urtica* spp. (nettles)  
*Vaccinium* sp. (blueberry)  
*Viburnum* spp. (arrowwoods)  
*Vicia faba* (broad bean)  
*Vinca* spp. (periwinkles)  
*Vitis* spp. (grape)  
*Weinmannia racemosa* (kamahi)  
*Zea mays* (corn)  
*Zelkova serrata* (Japanese zelkova)